

Claims

We claim:

1. A method for summarizing a compressed video, comprising:
 - measuring a cumulative motion activity intensity in the compressed video;
 - selecting key frames from the compressed video according to the cumulative motion activity intensity; and
 - concatenating the key-frames in a temporal order to form a summary of the compressed video.
2. The method of claim 1 further comprising:
 - partitioning the compressed video into a plurality of segments, each segment having a substantially equal amount of cumulative motion activity intensity; and
 - selecting one key-frames from each segment.
3. The method of claim 1 wherein the number of segments is one less than a number of desired key-frames in the summary.
4. The method of claim 3 further comprising:
 - selecting a first frame of each segment as one of the key-frames of the summary; and
 - selecting a last frame of the compressed video as a last key-frame of the summary.

5. The method of claim 2 further comprising:
selecting a middle frame according to the accumulated motion activity intensity of each segment as one of the key-frames.
6. The method of claim 1 wherein the motion activity intensity is measured from an average motion vector magnitude.
7. The method of claim 1 wherein the motion activity intensity is measured from a median motion vector magnitude.
8. The method of claim 1 wherein the motion activity intensity is measured from a standard deviation of the motion vector magnitude.
9. The method of claim 1 further comprising:
partitioning the compressed video into a plurality of segments according to shot boundaries;
measuring the cumulative motion activity intensity in each segment;
selecting the key frames from each segment according to the cumulative motion activity intensity; and
concatenating the key-frames in a temporal order to form a summary of the compressed video.
10. The method of claim 1 further comprising:
partitioning the compressed video into a plurality of segments using a binary partitioning based on the cumulative motion activity intensity, wherein a first partitioning generates one segment that includes the entire video, a second partitioning generates two segments, each segment of the second partition having

a substantially equal amount of cumulative motion activity intensity, and each subsequent partitioning dividing segments of a previous partitioning into two equal halves based on the accumulated motion activity intensity until a predetermined number of segments are generated;

selecting a middle frame from each segment according to the cumulative motion activity intensity as one of the key-frames; and

concatenating the key-frames in a temporal order to form a summary of the compressed video.

11. A method for generating a progressive summary of a compressed video, comprising:

selecting key-frames in a progressive ordering from the compressed video until a termination condition is reached; and

concatenating the key-frames in a temporal order to form the progressive summary of the compressed video, the progressive ordering further comprising:

selecting a first frame of the compressed video as a first key-frame;

selecting a last frame of the compressed video as a second frame;

measuring a cumulative motion activity intensity in the compressed video, and selecting a middle frames from the compressed video according to the cumulative motion activity intensity as a third key frame;

partitioning the compressed video into two equal segments according to the motion activity intensity, and selecting a middle frame according to the cumulative motion activity intensity of each segment as a fourth key frame and a fifth key frame; and

iteratively partitioning each previously partitioned segment into two smaller equal sized segments according to the motion activity intensity, and selecting further middle frames according to the cumulative motion activity

intensity from each smaller sized segment as two next key-frames until the termination condition is reached.

For more details